Translation of German Patent DE 197 06 408 A1

Crosscut and miter saw

A crosscut and miter saw has a saw table (1) which forms an essentially horizontal supporting surface (5) for a workpiece and carries side stops (6, 7) for the workpiece. A saw head (10) is mounted on the saw table (1) such as to be pivotable manually about a horizontal axis (B) up to an end stop. A rotary table (4) having a saw slot (9) is arranged on the saw table (1). In order to also be able to saw through wide workpieces by simple resetting measures, the supporting surface can be displaced upward by a height (c) in the direction of the rotation axis (D) of the saw blade (12) by means of a spacing device (16 to 18). The side stop (6, 7) is adjustable in the lateral direction (d).

Description

The invention relates to a crosscut and miter saw having a saw table which forms an essentially horizontal supporting surface for a workpiece and carries a side stop for the workpiece, a saw head being mounted on the saw table such as to be pivotable manually about a horizontal axis up to an end stop, and a rotary table having a saw slot being arranged on the saw table, and the saw head striking the end stop when its rotating saw blade engages in the saw slot.

Such crosscut and miter saws are used for cutting long workpieces to length, for example strips or tubes. In such saws, the width of the workpiece which can be sawn through is restricted by the position of the supporting surface of the saw table and by the diameter of the saw blade engaging in the saw slot of the saw table in the end stop. Wider workpieces can be sawn with saw blades having a larger diameter. However, it is not possible to simply use a larger saw blade in a crosscut and miter saw, since a safety guard of the crosscut and miter saw is designed for the diameter of the saw blade.

In order to also be able to saw wider workpieces, it has been proposed to arrange the saw head in a horizontally displaceable manner. However, such a construction is expensive and results in a greater weight and larger dimensions of the crosscut and miter saw.

The object of the invention is to propose a crosscut and miter saw of the type mentioned at the beginning with which wider workpieces can also be sawn through by simple resetting measures.

According to the invention, the above object is achieved by the features of the characterizing part of claim 1.

If the supporting surface on the saw table is displaced upward by the spacing device, a workpiece placed on the supporting surface inevitably lies in the region of a larger chord of the saw blade of the saw head pivoted to the end stop than when the workpiece is placed directly on the saw table. For this purpose, the side stop is adjustable in such a way that the corner points of the wider workpiece lie inside the area of the saw blade. It is thus possible, with a raised supporting surface, to saw through a wider workpiece than in a deeper position of the supporting surface, it being possible for a thicker workpiece to be sawn through when the supporting surface is deeper than when the supporting surface is higher.

The spacing device is preferably formed by a support plate unit which can be put onto the saw table. The support plate unit, in accordance with the construction of the saw table, preferably consists of two outer support plates and a center support plate for the rotary table. As a result, the saw blade, in every angular position of the rotary table, always plunges into the same slot and does not cut the wooden plate.

In a preferred configuration of the invention, the support plate unit is made of wood. This is because wood is lightweight and is easy to machine. In this case, it is also unnecessary to prefabricate the saw slot of the support plate of the rotary table. It is sawn in the correct position at the same time as the workpiece during initial use of the support plate. However, the support plate unit may also be made partly or entirely of plastic.

The side stops are preferably adjusted by being removed, in particular unscrewed, from the saw table and by being put onto the support plate unit, specifically onto the two outer support plates, at a prepared location. The side stops can be fastened together with the support plate unit, specifically the outer support plates, for example by means of screws.

It is also possible to form the side stops directly, in particular also in one piece, on the support plate unit. This is because their desired position is fixed as a function of the height of the spacing device. The side stops of the saw table are always to be removed before the support plate unit is put on.

The support plate unit may also be constructed in one piece. In this case, the center part of the support plate unit cannot be rotated together with the rotary table. In the case of miter cuts having different angles, perpendicular and oblique saw cuts will then inevitably be produced in the center region of the support plate unit.

It is also possible, as a spacing device, to provide a lifting device for the saw table instead of the support plate unit, by means of which lifting device the supporting surface of said saw table can be shifted upward.

Further advantageous configurations of the invention follow from the subclaims and the description below. In the drawing:

Fig. 1 shows a crosscut and miter saw for use without a spacing device,

Fig. 2 shows the crosscut and miter saw with attached spacing device,

Figs 3 and 4 show the saw geometry when using the crosscut and miter saw without the spacing device, and

Fig. 5 shows the saw geometry when using the crosscut and miter saw with the spacing device.

A crosscut and miter saw has a saw table (1) which forms two outer parts (2, 3) and a rotary table (4) between them. The two outer parts (2, 3) and the rotary table (4) together form a horizontal supporting surface (5) for a workpiece (not shown in figs 1 and 2).

Side stops (6, 7) are releasably fastened to the outer parts (2, 3), for example by means of screws, and partly project above the rotary table (4). The rotary table (4) is pivotable in steps or in an infinitely variable manner about a vertical axis (A) by means of a handle (8). A saw slot (9) is provided in the rotary table (4).

A saw head (10) is mounted on the rotary table (4) such as to be pivotable about a horizontal axis (B). A top end stop is provided for the position shown in figs 1 and 2. The saw head (10) can be pivoted relative to the rotary table (4) about a further vertical axis (C) in order to create oblique miter cuts. The saw head (10) forms a safety guard (11) for a saw blade (12), which is mounted on said saw head (10) by means of a flange (13) and can be driven about a rotation axis (D) by means of an electric motor (14) arranged on said saw head (10). Provided on the saw head (10) is a handle (15) for pivoting the saw head (10) about the axes (B and C). For the end position of the saw blade (12) pivoted about the axis (B) into the saw slot (9) there is such a bottom end stop that the saw blade (12) cannot be pivoted further into the saw slot (9) by means of the handle (15), that is to say this is not possible without damage.

Various workpieces (W1, W2, W3) which are to be sawn through are shown in their cross section in figs 3 to 5. The workpieces are, for example, strips of wood. The workpiece (W1) has an almost square cross section. In comparison, the workpiece (W2) has a smaller thickness (D2) and a larger width (B2). The workpiece (W3) has a markedly smaller thickness (D3) than the workpiece (W2) and a substantially larger width (B3) than the workpiece (W2). The workpiece (W3) is, for example, a floorboard or wall or ceiling panel, whereas the workpieces (W1, W2) are squared pieces of timber. Saw blades (12) having the same diameter (12.1) and flanges (13) having the same flange diameter (13.1) are shown in each case in figs 3 to 5. To simplify the drawing, the teeth of the saw blade (12) are not shown. The diameter (12.1) of the saw blade (12) is about 254 mm, the diameter (13.1) of the flange (13) being about 50 mm.

The workpieces (W1, W2) can be sawn through with the crosscut and miter saw in the set-up according to fig. 1. For this purpose, the workpieces (W1 or W2) are placed against the side stops (6, 7) on the supporting surface (5) of the saw table (1) and the saw head (10) is pivoted downward in the direction of arrow (S) about the axis (B). When the workpiece (W1) has been sawn through, the saw blade (12) has covered its bottom corner points (W1.1 and W1.2) and the flange (13) virtually strikes a top center point (W1.3) of the workpiece (W1). The bottom end stop has not yet been reached in the process. The workpiece (W1) has, for example, a cross section of about 100 mm in width (B1) and about 90 mm in thickness (D1).

The workpiece (W2) (cf. fig. 4) can also be sawn through in the set-up of the crosscut/miter saw according to fig. 1. The width (B2) is, for example, about 140 mm and the thickness (D2) is about 60 mm. In

this case, in fig. 4, the saw head (10), in the direction of arrow (S), is pivoted further in the direction of the bottom end stop without reaching the latter. In the process, the saw blade (12) penetrates further into the saw slot (9) than is the case during the sawing according to fig. 3. The saw blade (12) enters the saw slot (9) of the rotary table (4) by the depth (a).

The workpiece (W3), whose width (B3) is about 210 mm to 220 mm and whose thickness (D3) is, for example, about 15 mm to 20 mm, obviously cannot be sawn through with the miter saw in the set-up according to fig. 1. So that a workpiece like the workpiece (W3), which is substantially wider but thinner than the workpieces (W1, W2), can also be sawn through with the crosscut/miter saw, a spacing device formed by a support plate unit is provided.

The support plate unit consists of two outer support plates (16, 17) and a center support plate (18) (cf. fig. 2). In its basic form, the outer support plate (16) is adapted to the outer part (2) of the saw table (1). The support plate (17) projects beyond the part (3) of the saw table (1) by the amount e, by which the stop (7') in fig. 2 is also displaced relative to the stop (7) in fig. 1. As a result, the saw motor does not strike the stop (7) in any position of the rotary table. The center support plate (18) is adapted to the rotary table (4). The height or thickness (c) of the support plates (16 to 18) is the same and is about 6% to 20% of the diameter of the saw blade (12), for example 30 mm. The support plates (16 to 18) put onto the saw table (1) form a smooth supporting surface (5') for the workpiece (W3), this supporting surface (5') being displaced upward by the distance (c) relative to the supporting surface (5) in the direction of the rotation axis (D).

The support plates (16 to 18) are made of wood. The center support plate (18) has a saw slot (19), which is in alignment with the saw slot (9) of the rotary table (4). The saw slot (19) need not be preformed on the center support plate (18). It may be produced when work is being carried out during sawing operation with the support plate unit (16 to 18). The support plates (16, 17) are screwed with the screws of the stops (6, 7) in the screw threads (20, 21, 24, 25) provided for the latter.

Since the side stops (6, 7) would get in the way in their position according to figs 1, 3 and 4, they are removed from the saw table (1) and, for work with the support plate unit (16 to 18), they are put onto the outer support plates (16, 17) of the latter at a distance (d) (cf. fig. 5) opposite their original position (cf. figs 3, 4). The side stops in this position are designated by 6', 7' in fig. 5. The means of fastening the outer support plates (16, 17) to the outer parts (2, 3) of the saw table (1) and the side stops (6', 7') may be provided by a common screwed connection (not shown), by which, firstly, the side stops (6', 7') are fastened in the correct position (distance d) to said support plates (16, 17) and, secondly, said side stops (6', 7') and the outer support plates (16, 17) are fastened to the outer parts (2, 3) of the saw table (1). The side stop (7) is additionally displaced to the right by the amount e in order to prevent the motor coming down on it.

It is also possible to form separate side stops (6', 7') on the outer support plates (16, 17), the side stops (6, 7) of the saw table (1) then being put aside when working with the support plate unit.

In the set-up of the crosscut/miter saw according to figs 2 and 5, the bottom corner points (W3.1 and W3.2) lie in the region of the saw blade (12) pivoted in

direction (S) about the horizontal axis (B), the distance (d) being about 15% to 30%, in particular about 20%, of the diameter (12.1) of the saw blade (12). The workpiece (W3) is thus sawn through if the saw blade (12) has plunged into the saw slots (9) of the rotary table (4) by the depth (b). This plunge depth is smaller than the plunge depth (a) (cf. fig. 4), so that, even at the plunge depth (b), the bottom end stop of the saw head (10) has still not been reached. Since, according to fig. 5, the flange (13), at the plunge depth (b), still does not touch the workpiece (W3), it is also possible, in the set-up according to fig. 3, to saw through workpieces whose thickness (D3), at the same width (B3), is greater than in the workpiece (W3).

In view of the relationships shown in fig. 5 for a workpiece of thickness (D3), it would also be possible, given an appropriate thickness of the support plates (16, 17) and an appropriate side position (d) of the side stops (6', 7'), for the saw blade (12) to also saw through workpieces whose width is even greater than the width (B3). This reaches its limit when the flange (13) strikes the workpiece at the top when pivoting in direction (S). In all cases, it is ensured that the workpiece is essentially sawn through before the saw head (10) strikes the bottom end stop when pivoting in direction (S) about the horizontal axis (B).

Patent claims

1. A crosscut and miter saw having a saw table which forms an essentially horizontal supporting surface for a workpiece and carries a side stop for the workpiece, a saw head being mounted on the saw table such as to be pivotable manually about a horizontal axis up to an end stop, and a rotary table having a saw slot being arranged on the saw table, and the saw head striking the end stop when its rotating saw blade engages in the saw slot, wherein the supporting surface (5, 5') can be displaced upward by a height (c) in the direction of the rotation axis (D) of the saw blade (12) by means of a spacing device (16 to 18), and wherein the side stop (6, 7) is adjustable in the lateral direction (d).

2. The crosscut and miter saw as claimed in claim 1, wherein the spacing device is formed by a support plate unit (16 to 18).

3. The crosscut and miter saw as claimed in claim 2, wherein the support plate unit has two outer support plates (16, 17) for outer parts (2, 3) of the saw table (1) and a center support plate (18) for the rotary table (4).

4. The crosscut and miter saw as claimed in claim 3, wherein the outer support plates (16, 17) can be fastened to the outer parts (2, 3) of the saw table (1), and wherein the center support plate (18) can be fastened to the rotary table (4) and can be pivoted with the latter.

5. The crosscut and miter saw as claimed in one of the preceding claims, wherein the side stops (6, 7) can be removed from the outer parts (2, 3) of the saw table (1) and can be fastened to the outer support plates (16, 17).

6. The crosscut and miter saw as claimed in one of the preceding claims, wherein the support plates (16, 17) can be fastened to the outer parts (2, 3) of the saw table (1) with the same means, for example screws, as side stops (6', 7').

7. The crosscut and miter saw as claimed in one of the preceding claims, wherein the height (c) is about 6% to 20% of the diameter (12.1) of the saw blade (12).

8. The crosscut and miter saw as claimed in one of the preceding claims, wherein the distance (d) by which the side stops (6, 7) are adjustable is about 15% to 30% of the diameter (12.1) of the saw blade (12), and the distance (c) is so large that the motor does not touch the stop (7) in any pivoted position.

9. The crosscut and miter saw as claimed in one of the preceding claims 2 to 8, wherein the support plate unit (16 to 18) is made of a material in which at least one saw slot (19) can be sawn by means of the saw blade (12), which saw slot (19) is in alignment with the saw slot (9).

10. The crosscut and miter saw as claimed in one of the preceding claims, wherein the support plate unit (16 to 18) is made of wood.

2 pages of drawings attached

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Figure 1

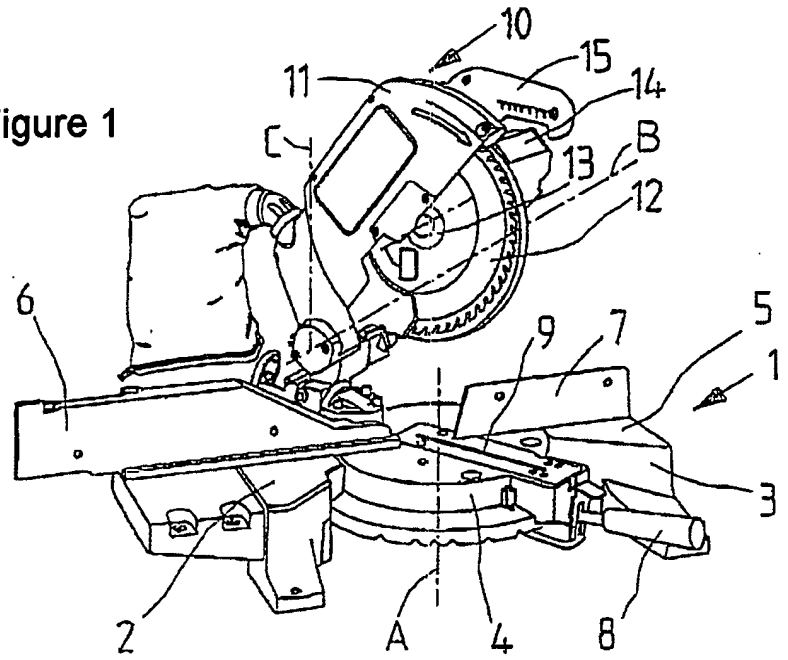
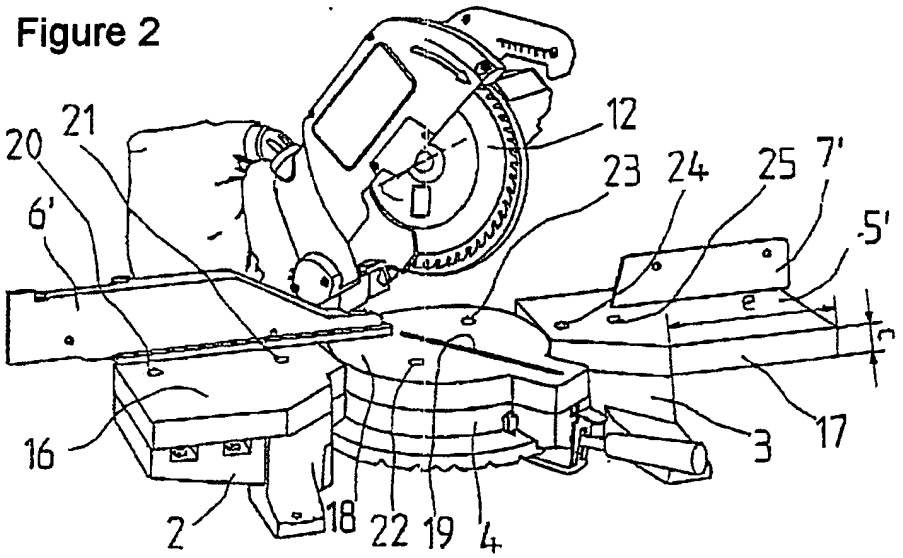


Figure 2



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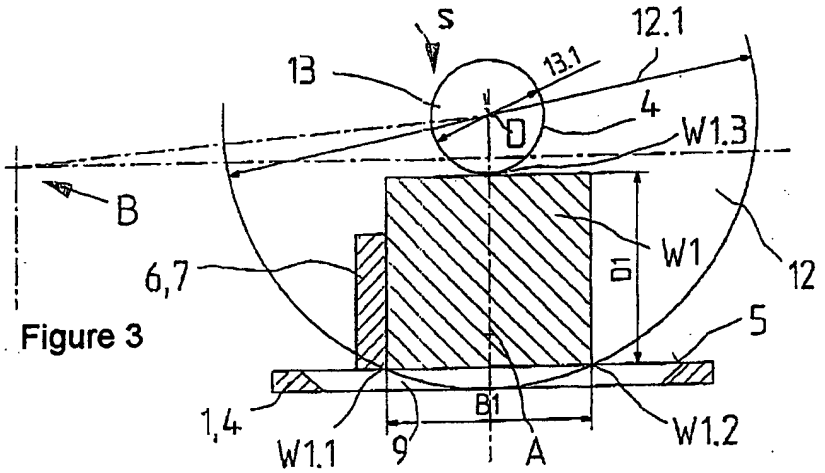

Figure 3

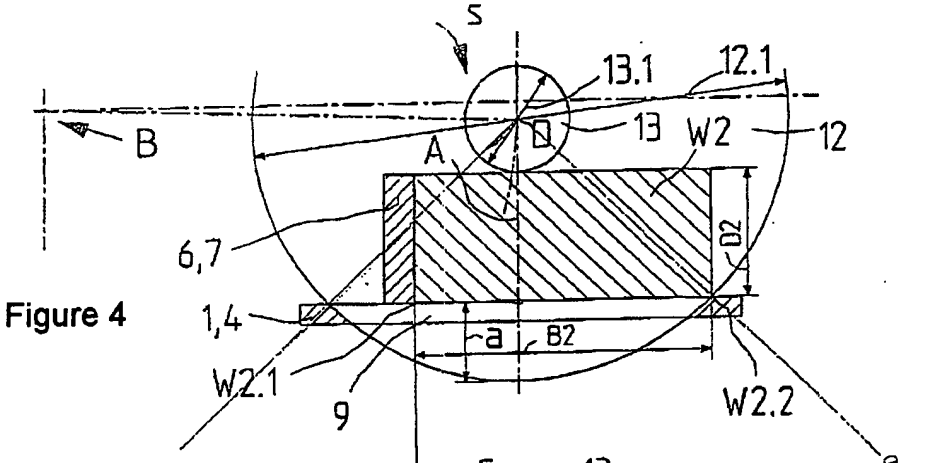

Figure 4

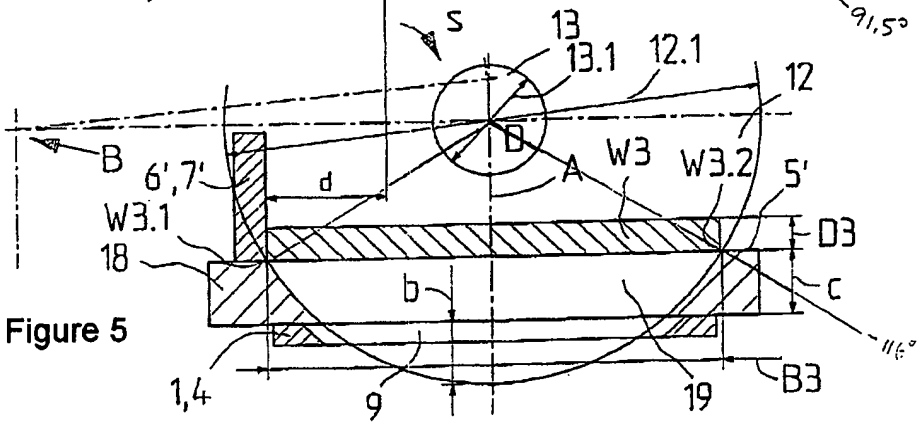

Figure 5